WHAT IS CLAIMED IS:

1. A composition for reversing an ongoing adverse immune response in a patient, which comprises a therapeutically effective amount of a proteasome inhibitor and a pharmaceutically acceptable carrier.

2. The composition of claim 1, wherein said reversal of said immune response is a consequence of administering said proteasome inhibitor after an antigenic activation of T-cells, said inhibitor reduces activated T-cells, thereby reversing said immune response.

3. The composition of claim 2, wherein said adverse immune response is an autoimmune disease.

4. The composition of claim 2, wherein said adverse immune response is a graft rejection.

5. The composition as defined in ~~any one of~~ claims 1 ~~to 4~~, which is to be administered to said patient, once the patient's T cells are mostly activated during said adverse immune response.

6. The composition of ~~any one of~~ claims 1 ~~to 5~~, wherein said proteasome inhibitor is lactocystin or an analogue thereof.

7. The composition of ~~any one of~~ claims 4 ~~to 6~~, which is to be administered to said patient at least 24h after a graft transplantation.

8. The composition of ~~any one of~~ claims 1 ~~to 7~~, further comprising an immuno-suppressive drug.

9. The composition of claim 8, wherein said immuno-suppressive drug is

selected from the group consisting of cyclosporin A, rapamycin and FK506.

10. A composition which comprises an effective amount of a proteasome inhibitor for disrupting mitochondrial function by blocking electron transport and/or inducing cytochrome C leakage from the mitochondria, which results in caspase activation and leads to cell apoptosis.

11. The composition of claim 10, wherein said proteasome inhibitor is lactocystin or an analogue thereof.

12. The composition of claim 11, which alleviates a pathological condition having high mitochondrial activity.

13. The composition of claim 10 [redacted], for the treatment of a pathological condition selected from the group consisting of cancer, inflammation and adverse immune response.

14. A composition for disrupting nitric oxide synthesis by inhibiting nitric oxide synthase gene expression, which comprises an effective amount of a proteasome inhibitor.

15. The composition of claim 14, wherein said proteasome inhibitor is lactocystin or an analogue thereof.

16. The composition of claim 15, wherein said composition alleviates a pathological condition having upregulated nitric oxide synthase expression.

17. The composition of claim 16, wherein said pathological condition is inflammation or septic shock.

18. A method for screening a compound for proteasome inhibition activity, which comprises: obtaining a mammalian cell lysate comprising proteasomes, a

partially purified proteasomes preparation or a purified proteasomes preparation; tagging at least one peptide substrate specific to a known proteasome protease activity; combining said proteasomes and said at least one tagged peptide substrate; contacting the so combined proteasomes/tagged peptide substrate with said compound; said at least one tagged peptide substrate fails to release tag if said compound is a proteasome inhibitor, and detecting a decrease or absence of the released tag in the presence of said compound relating to the released tag in the absence of said compound as an indication of proteasome inhibition activity for said compound.

19. The method of claim 18, wherein said at least one tagged peptide substrate is a fluorogenic peptide.

20. The method of claim 18 [redacted], wherein said proteasome protease activity is trypsin-like chymotrypsin-like or peptidylglutamyl-peptide hydrolyzing activity.